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PRO-MIG250 PORTABLE INVERTER MIG/MAG/MMA WELDER

OPERATING INSTRUCTIONS

CE

Version 2014-2

Thank you for selecting the R-Tech PRO-MIG250 Portable Inverter MIG/MAG/MMA Welder.

The PRO-MIG250 has many benefits over traditional transformer MIG welders, including infinite power control, adjustable arc force and a durable metal wire feed mechanism to provide very smooth wire feed and weld characteristics

We want you to take pride in operating our PRO-MIG250, as much as we have taken in making this product for you. Please read all information in this manual before operation

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt from the courier. Consequently all claims for material damaged in shipment must be made by purchaser against the transportation company used.

Please record your welding equipment identification below for future reference. This information can be found on data plate at rear of machine.

Product **PRO-MIG250**

Serial No. _____

Date of Purchase _____

Where Purchased _____

Whenever you request replacement parts or information on this equipment please supply the information you have recorded above

This product is covered by 2 years parts and labour warranty, we will cover cost of collecting and returning item to you (UK mainland only, other areas are RTB). External items, torch, earth lead etc are covered by 3 months warranty. Any faults/damage found caused by customer will be charged pro-rata

Please read this operator manual completely before attempting to use this equipment.
Pay particular attention to the safety instructions we have provided you for your protection

The level of seriousness to be applied to each section is explained below

WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury.

CAUTION

This statement appears where the information must be following to avoid a minor personal injury or damage to this equipment.

Introduction

The R-Tech PRO-MIG250 is a member of our highly acclaimed family of welding products. Premium features include:-

- Inverter power source – more efficient to operate, provides smoother weld characteristics than traditional welders
- Infinite welding voltage to allow fine tuning of weld characteristics
- Euro type torch fittings for easy torch fitment/replacement
- 35% Duty cycle at 250 Amps @ 40C (MIG)
- 60% Duty cycle at 200 Amps @ 40C (MIG)
- Lightweight and portable – Ideal for maintenance and mobile welders

Recommended Processes

The R-Tech **PRO-MIG250** is recommended for the MIG welding processes within its output capacity of 250 Amps DC (MMA 200Amps)

Welding Capability – Duty Cycle - Equipment Limitations

The R-Tech **PRO-MIG250** is rated at 250 Amps at 35% and 200 Amps @ 60% duty cycle on a ten minute basis. If the duty cycle is exceeded a thermal protector will shut the machine off until it cools.

Technical Specifications

Model No.	R-Tech PRO-MIG250	
Input		240V AC 50/60Hz
MIG Operation	Fuse Rating	22A
	Rated Output Current	250Amps max
	Generator required KVA	7 KVA
	Duty Cycle @ 250 AMPS	35% @ 40°C
	Duty Cycle @ 200 AMPS	60% @ 40°C
	Duty Cycle @ 160 AMPS	100% @ 40°C
	Output current Range	30 - 250 AMPS
	Wire sizes Steel	0.6,0.8,1.0mm
	Wire sizes aluminium	0.8,1.0,1.2mm
MMA Operation	Rated Output Current	20 0Amps Max
	Generator required KVA	7 KVA
	Duty Cycle @ 200 AMPS	35% @ 40°C
	Output current Range	15 - 200 AMPS
	No Load Voltage	74V
Gross Weight		18KG
Insulation		Class F
Efficiency		$\eta \geq 0.85$
Power factor		$\lambda = 0.8$

Safety Precautions

Read entire section before starting installation

WARNING!

Electric Shock can kill – Only qualified personnel should perform this installation. Turn off input power at the fuse box before working on this equipment. Do not touch electrically live parts. Always connect the machine to an earthed mains supply as per national recommended standards.

Select suitable location

Place the welder where clean cooling air can freely circulate in and out of the front & rear louver vents. Dirt, dust or any foreign material that can be drawn through vents into welder must be kept to a minimum. Failure to observe these precautions can result in excessive operating temperatures which can lead to plant failure.

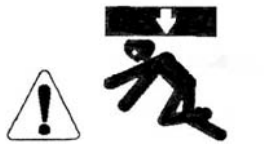
Grinding

Do not direct grinding particles towards the welder. An abundance of conductive material can cause plant failure.

Stacking

This machine cannot be stacked. **Transport – Unloading**

Never underestimate the weight of equipment, never move or leave suspended in the air above people. Use recommended lifting equipment at all times.

WARNING! 

Falling Equipment can cause injury. Never lift welder with gas bottle attached. Never lift above personnel.

Tilting

Machine must be placed on a secure level surface or on a recommended undercarriage/trolley. This machine may topple over if this procedure is not followed.

Environmental Rating

The welding power source carries the IP21S rating. It may be used in normal industrial and commercial environments. Avoid using in areas where water / rain is around.

Read and follow the ‘Electric Shock Warnings’ in the safety section if welding must be performed under electrically hazardous conditions such as welding in wet areas or water on the work piece.

Electrical Installation

WARNING!

ELECTRIC SHOCK CAN KILL

Machine grounding and High Frequency Interference Protection

This welder must be grounded to earth. See national electrical codes fro proper grounding methods.

The high frequency generator being similar to a radio transmitter may cause interference to radio, TV and other electronic equipment. These problems may be the result of radiated interference. Proper grounding methods can reduce or eliminate this.

Radiated interference can develop in the following ways

1. Direct interference from welder power source
2. Direct interference from the welding leads
3. Direct interference radiated from feedback into power lines
4. Interference from re-radiation by un-grounded metallic objects.

Keeping these contributing factors in mind, installing equipment as per following instructions should minimize problems.

1. Keep the welder input power lines as short as possible and enclose as much of them as possible in metal conduit or equivalent shielding. There should be a good electrical contact between this conduit and ground (Earth).
2. Keep the work and electrode leads as short as possible. Tape the leads together where practical.

3. Be sure the torch and earth leads rubber coverings are free from cuts and cracks that allow welding power leakage
4. Keep earth lead connection to work in good condition – Clean area on workbench where earth clamp is situated on a regular basis.

Input Connections

Make sure the voltage, phase and frequency of input power is as specified on machine rating plate located at rear of machine.

Have a qualified electrician provide suitable input power as per national electrical codes. Make sure machine is earthed / grounded.

Make sure fuse or circuit breaker is correct rating for machine. Using fuses or circuit breakers smaller than recommended will result in ‘nuisance’ shut off from welder inrush currents even if welding at low amperages.

Failure to follow these instructions can cause immediate failure within the welder and void machines warranty.

Turn the input power OFF at the mains switch & fuse box before working on this equipment.

Have a qualified electrician install & service this MIG welding equipment.

Allow machine to sit for 5 minutes minimum to allow the power capacitors to discharge before working inside this equipment. Do not touch electrically live parts

The PRO-MIG250 MIG Welder requires a 240V 50/60Hz 1-Phase 22A supply. It comes with a 2 metre mains cable attached. Connect wires according to national coding.

Brown wire – Live - **Blue wire – Neutral** - **Green/Yellow Wire – Earth (Ground)**

Connecting to an Engine Driven Generator

If connecting this machine to an engine driven generator please ensure the following

Minimum Generator KVA Output – 7 KVA continuous
Generator to be fitted with AVR (automatic voltage regulation)

DO NOT USE ON A GENERATOR WITHOUT AVR. Connecting to a generator without the above minimum requirements may in-validate your warranty

Connections for PRO-MIG250

Setup machine as per two diagrams below:

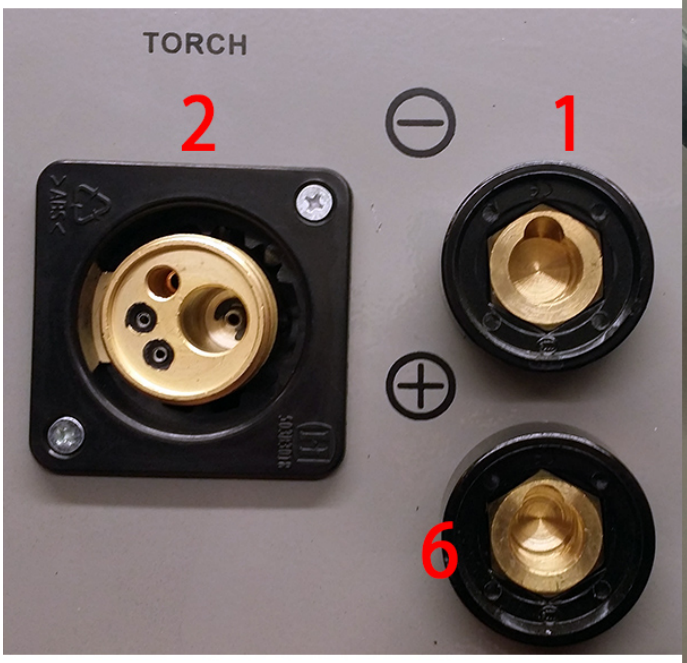


Fig 1

Fig 2

1. **Earth / Workpiece connector.** Connect the earth lead (negative -) to this connector. Insert male connector into socket and twist clockwise until tight. Secure other end of earth lead to Workpiece via the earth clamp.

2. **Euro torch connector.** Connect Euro type MIG torch to euro torch connector, align torch connector to machine connector and then turn retaining ring clockwise to secure. Ensure torch is secured tightly to avoid weld power problems. To avoid electric shock keep the MIG torch in good condition and replace if any of the insulation is damaged.

3. **Mains input cable.** Fit required plug as per legal requirements.

4. **Gas inlet connection.** Connect gas hose to rear of machine and then to regulator on gas bottle. Ensure all connections are tight to ensure no loss of gas. Make sure gas bottle is secured to avoid injury as per local health and safety requirements..

5. **On/Off Power Switch.** This turns the **PRO-MIG250** MIG Welder on and off.

6, **+ Power socket**:
In MMA mode fit electrode holder to this to give positive electrode.

For MIG welding with ‘gasless’ wire, connect earth lead to this socket and change internal polarity cable to negative - For gasless welding torch is – negative and earth is + positive

Controls and Settings

Fig 3

1. **Welding Voltage.** This adjusts the welding voltage (weld power) from 0 to 10. Adjust knob for power output required by job – range is 30 to 250 amps.

2. **Wire Speed.** This adjusts the wire feed speed from 0-100%. Adjust the wire speed to suit welding voltage (Fig3.1) and job requirements

3. **MMA Amps.** This adjusts the MMA welding amperage (weld power) from 0 to 10. Adjust knob for power output required by job – range is 15 to 200 amps.

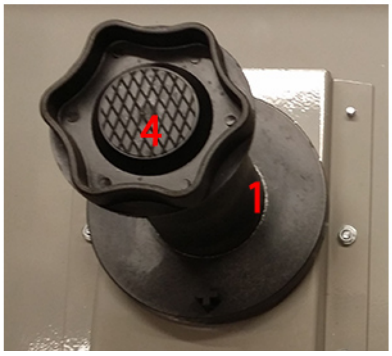
4. **Mig / MMA switch** This switches between the machines two welding modes MIG / MMA

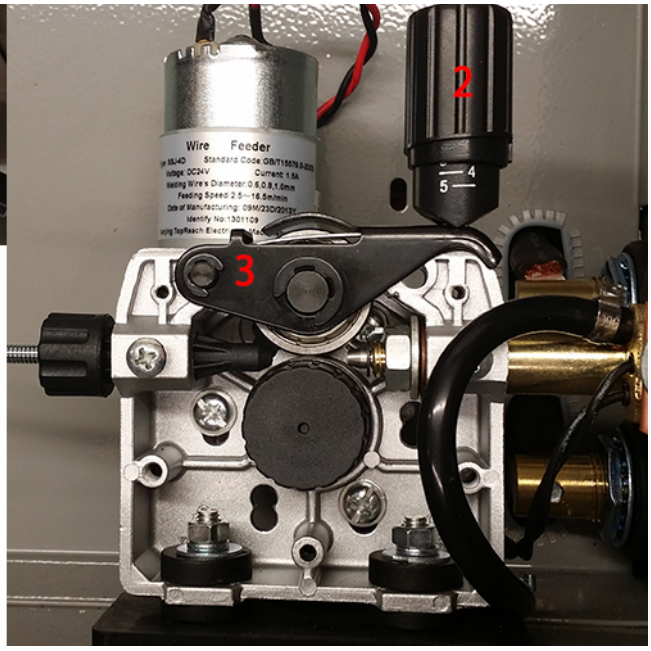
5. **OT LED -** If this LED illuminates the duty cycle of machine has been exceeded, the machine will stop working and the fan will continue to run until machine has cooled down. The light will go off and welding may be carried out again.

6. Warning LED This warning light will come on under these situations to warn of either low input voltage has been sensed or there is an internal fault with machine, check wiring connections, if still illuminated contact R-Tech support department.

7. Power LED This lights when machine is switched on

Wire Spool Fitment & Polarity Change (Gasless wire)





1. Wire reel tensioner. Remove item 4 and adjust bolt inside to adjust tension on wire feed reel, if too loose when trigger is released and wire feed motor stops, the reel will continue to spin and cause wire to bird nest off the reel. To tight adjustment will cause premature motor failure. It should just have slight tension when turned by hand.

2. Roller tensioner. This sets the pressure of rollers, be careful not over tighten wire feed pressure roller as this can cause premature motor and roller failure. Correct way to adjust tensioner is to slacken off pressure so that MIG welding wire does not feed, slowly adjust pressure until wire feeds smoothly, you should be able to stop wire feeding by holding wire and it should slip on rollers. If you have too little pressure wire will slip when welding causing unwanted Burn back into tips or erratic weld beads size.

3. Wire Feed Drive Assembly. Make sure rollers are correct size for wire diameter selected, to change roller size release retaining screw, remove roller turn roller around and slide onto shaft making sure the right size groove is in line with wire and refit retaining screw. The Pro-MIG250 comes fitted with a dual roller 0.6mm+0.8mm & 0.8mm+1.0mm

4. Wire reel retainer. Remove the wire reel retainer and wire reel adaptor, slide on roll of wire and refit the reel adaptor.

5. Internal – negative connector. When using gasless wire, move internal (inside wire feed cabinet) cable to this connector – This then makes the torch negative, you would then connect Workpiece earth lead to + positive connector on front of machine (fig 2.1)

6. Internal + positive connector. When using normal welding wire (not gasless), move internal (inside wire feed cabinet) cable to this connector, This then makes the torch positive, you would then connect Workpiece earth lead to - negative connector on front of machine (fig 2.2)

Operating the Machine

SAFETY PRECAUTIONS

WARNING!

ELECTRIC SHOCK CAN KILL

Do not touch electrically live parts or electrode with skin or wet clothing.
Insulate yourself from work and ground
Always wear dry insulating gloves

WARNING!

FUMES AND GASES can be dangerous

Keep your head out of fumes & gases produced from welding.
Use ventilation or exhaust to remove fumes & gases from breathing zone and general area.

WARNING!

WELDING SPARKS can cause fire or explosion

Keep flammable material away from work area.
Do not weld on containers that have held combustibles

WARNING!

ARC RAYS can burn

Wear eye, ear and body protection – Make sure work area is protected by proper shielding to avoid injury to passers by.

Operating the Machine in MIG mode

Once you have set machine up as per above instructions.

1. Select welding voltage (power) required on front panel

2. Select wire feed speed required on 'wire speed' knob

3. Ensure you are wearing the correct safety clothes & equipment for welding (I.E Welding mask, gloves, apron etc)

4. Press torch trigger to start welding process and adjust welding current knob to adjust wire feed accordingly.

5. The LED display will show actual welding amperage when welding (Display will show 000 when not welding)

Note: You can finely adjust the welding current knob to fine tune weld arc length to either DIP or SPRAY welding DIP is when the wire is melting very close to the workpiece (Short arc length), SPRAY is when the wire is melting far away from workpiece (Long arc length)

1. Tips on welding aluminium

When welding aluminium as the wire is much softer than steel wire you have to fit a Teflon liner in place of the steel liner in MIG torch, this is so the wire feeds much smoother and stops it snarling at rollers.

To fit a Teflon liner, remove steel liner from torch and fit Teflon liner so you have about 10 inches left coming out end of MIG torch at the machine end. In the brass euro body where torch fits onto you will see a brass guide tube, remove this tube (you will have to remove circlip to allow this) and fit torch to machine and cut off excess Teflon liner as required.

You want the Teflon liner to get as close to the wire feed rollers as possible. Best way to cut liner is with a sharp knife blade. Adjust the wire tensioner to minimum pressure and tighten down until wire is gripped, too much pressure will deform wire and end up with snarls by rollers.

The **PRO-MIG250** is fitted with rollers for steel wire as standard. Fit U-Groove rollers for alloys and oversize welding tip. These are available and have and 'A' after tip size. I.E 0.8A where as for steel wire it would just say 0.8

2. Tips on using gasless wire

When using gasless wire you have to change the polarity of the arc. This can be done simply by reversing the cables inside wire feed cabinet

Gas wire = Positive torch – Negative work (machine is set as standard)
Gasless wire = Negative torch – Positive earth

Operating the Machine in MMA mode

Connect the following:

1. **Negative welding power connector**
   Connect the earth cable dinse plug into here and twist to secure

2. **Positive welding power connector**
   Connect the electrode holder cable dinse plug into here and twist to secure

Most popular rods have a positive welding electrode and negative earth. If you are using special electrodes check the manufacturer's recommendation for correct polarity of welding electrodes and connect as required.

1. Ensure machine is setup as previously stated
2. Fit desired electrode size in electrode holder
3. Switch on machine
4. Set Mig/MMA switch to MMA position
5. Select desired welding power
6. Touch electrode on to workpiece and the arc will start

When the machine is switched on, output terminals are always live, take care and do not touch electrode and earth by person at same time, otherwise an electric shock will occur.

Maintenance

Routine and periodic maintenance

WARNING!

ELECTRIC SHOCK CAN KILL

Turn the input power OFF at the mains switch & fuse box and remove mains plug from socket before working on this equipment.
Have a qualified electrician install & service this equipment.

Allow machine to sit for 5 minutes minimum after disconnection from mains power to allow the power capacitors to discharge before working inside this equipment.

Do not touch electrically live parts

1. Periodically (3-6 months depending on use / environment), remove the side/top panels of machine and clean out machine with a low pressure dry air line paying particular attention to PC Boards, Fan blades and switchgear Failure to maintain plant can void manufacturers warranty.
2. Inspect input and output cables & hoses for fraying and cuts, replace if damaged present

3. Keep the MIG torch and earth cables in good condition
4. Clean the air vents to ensure proper air flow and cooling
5. The fan motor has sealed bearings which requires no maintenance

Troubleshooting

Service & repair should only be performed by R-Tech welding trained personnel. Unauthorized repairs performed on this equipment may result in danger or injury to the technician and machine operator and will invalidate your warranty. For your safety and to avoid electric shock, please observe all safety notes and precautions detailed throughout this manual

The troubleshooting guide is provided to help you locate possible machine malfunctions

If fault / problem is not listed below check our Mig Welder Support page on our website: www.r-techwelding.co.uk/support.php or contact R-Tech by phone. Contact details can be found on our website

Output Problems

No output - Power light is not lit
Check machine on/off switch is in the 'on' position Check Input power to machine Check plug wiring Check mains trip / fuses

No output - Fan runs - Power light is lit
Check torch connections are secure and torch switch operation, try replacing MIG torch.

No output - Power light is lit - Warning light is lit
Welding application may have exceeded recommended duty cycle, allow machine to cool down until the warning light goes out.

No output – Power light is lit – Gas at torch tip – No wire feed
Check wire feed unit protecting fuse on rear of machine, if blown replace with new fuse of same rating, if the fuse blows again contact R-Tech

Machine keeps overheating - Warning light is lit on machine
Check if fan is running – if not contact R-Tech. Check the cooling vents for obstruction, blow out machine with clean dry low pressure air supply. Check for adequate ventilation around machine

Porosity in weld – No / low gas at torch tip
Check gas supply from gas bottle, check flow rate on regulator, check gas hose for restrictions, check for draughts in local area, open doors etc Replace MIG torch – it may have gas restriction.

Poor weld penetration
Check condition of earth lead and clamp and ensure clamp is connection via a clean area on work piece. Check the condition of the MIG torch, try another MIG torch.

● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。	● 維修前切斷電源。	● 儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的説明以及應該使用的銀焊材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絕緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.